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ABSTRACT

Six of the 10 existing research studies that attempt to characterize the composing process by examining certain components and behaviors are critically reviewed in this paper. For each study, the aims and data gathering and sampling procedures are described, and the findings, interpretations, design, and rationale of the research are critically appraised and related to cognitive processing theory. The six studies reviewed are (1) Janet Emig's "The Composing Processes of Twelfth Graders," (2) Sondra Perl's "Five Writers Writing: Case Studies of the Composing Processes of Unskilled College Writers," (3) Linda Flower and John Hayes's "The Cognition of Discovery: Defining a Rhetorical Problem," (4) Donald Graves's "An Examination of the Writing Processes of Seven-Year-Old Children, (5) Charles Stallard's "An Analysis of the Writing Behavior of Good Student Writers," and (6) Sharon Pianko's "A Description of the Composing Processes of College Freshmen Writers." The paper concludes that these largely naturalistic preexperimental case studies need to be used as the basis for further, more formal experimental research. (JL)

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The Composing Process

A Critical Review of Some Recent Studies

by Avon Crismore

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The Composing Process:
A Critical Review of Some Recent Studies

The purpose of this paper is to critically review the literature of research studies that attempt to characterize the composing process by examining certain (a) components, and (b) behaviors. A characterization of the composing process is a description of the mental tools, materials, and procedures people use in producing written texts (Clark and Clark, 1977).

Written language is basically an instrument of communication. People write in order to convey ideas to others--to inform them, persuade them, entertain them, or inspire them. People also use written language as an instrument of self-expression. Written language has not only a structure--what linguists try to capture with their rules--but also a function for the structure--what generative semantists and pragmatists try to specify in their rules. Many language experts believe that the structure and function of written language do not

reveal the processes or sequential steps involved in producing a text and that the mental processes by which people compose written texts are beyond structure and function and need to be studied on their own, and by their own methods (Clark and Clark, 1977).

Characterizing the processes involved in comprehension, production, and acquisition has helped researchers and educators in the reading and speech areas make substantial progress in designing significant basic and applied research and new teaching methods and materials in recent years. Processing models such as the passive--or "bottom-up"--reading model of Gough (1972); the active--or "top-down"--model: the Hypothesis Test of Neisser (1967), Smith (1971), and Goodman (1967); the combined "interactive" model of Rumelhart (1977); and the Substrata-Factor theory of important variables in causes of reading failure and success of Holmes (1976); all helped characterize reading ability. Speech production studies such as those examining the extent of preschoolers' production of requests for action or directives (Read and Cherry, 1978) and those comparing speech production differences in preschoolers in 2 situations (Cole et al., 1978) and

studies of how children acquire conversational turn-taking knowledge (Ervin--Tripp, 1977) help characterize speaking ability. The knowledge gained from studying processes in reading comprehension and speech production and acquisition was possible because the research was grounded in learning theory and used perceptual, cognitive, psycholinguistic, information-processing, cultural, and affective models (Singer and Ruddell, 1976).

Just as characterizing processes was important for reading and speech progress, it is also important for progress in written composition. An implication for education follows directly from viewing writing as a process composed of subprocesses. If people can learn to separate the task components of the composing process, they can learn to use the most effective strategies for each subprocess. They can learn, for instance, the proper way to edit and the proper time to edit.

They can learn how to concentrate on one task of a subprocess and ignore other constraints (Hayes, 1979). These techniques are not usually taught explicitly to students and are usually learned in a trial and error fashion. Knowing

how one subprocess task interacts with another in order to achieve or prevent a communicative goal is also necessary. Just knowing techniques is not enough, for using a particular technique to achieve a goal may interfere with the attainment of another goal.

Until recently there has been very little systematic direct observation of writers at work. It is probable that there are very significant dissimilarities between fluent writing and learning to write just as there are between fluent reading and speaking and learning to read and speak. By systematically observing writers at work composing, it should be possible to characterize the differences between skilled and unskilled writers and to pinpoint the sources of individual differences. It may well be that some of the assumptions about writing implicit in various teaching methods will be challenged when we know more about the mental processes used in composing (Britton, 1975). Before Janet Emig's study of The Composing Processes of Twelfth Graders in 1971 there were no research studies that focused on the act of writing. Since then Sawkins, (1971); Stallard, (1972); Graves, (1973); Mischel, (1974); Britton et al., (1975); and Beach, (1976);

Perl, (1978); Sommers, (1978); Flower and Hayes, (1978); and Pianki, (1978) have examined components of the composing process. The studies cover the age range of second-graders to adult writers and focus on the whole composing process or a subprocess. Exciting things are happening in recent research on the composing process. Many more researchers are carrying on studies now using questions raised in the earlier studies for researching.

One of the new theoretical approaches to the study of the composing process is the cognitive science approach used by researchers such as Alan Collins, Linda Flowers, and John Hayes. These researchers made strategic decisions in carrying out their research about how best to proceed and the best mode to use with protocols. These decisions reflect their scientific biases. The decisions were shaped by the world since people were insistent that researchers pay attention to certain salient facts and were also shaped by the writing process itself. These researchers made 5 strategic decisions:

1. They would focus on the act of writing; the process not the product.

2. They would try to build a model of the composing process.

3. They would model the individual writer.

4. They would work "top-down" or holistically.

5. They would divide up the writing tasks part by part. These decisions characterize the nature of their research.

The data they use are undeleted verbatim transcripts of experimenter notes. The transcripts are called protocols and are examined for evidence of the writing process. The subjects are thinking aloud while they are composing, so the mode used is an oral mode for the protocols. The cognitive processing researchers assume that thinking aloud closely resembles silent composing. They refer to their method as protocol analysis.

Cognitive researchers realize that not all writers write in the same way. For instance, some writers start a topic sentence, polish it and write nothing else until it is perfect and then continue. Some write with an audience in mind and some write serenely unaware of an audience. In modeling a writer, there are several ways to deal with individual differences. One way is to have a single model of

an average writer. The advantage is simplicity but the disadvantage is that it may not represent anyone. An alternative way is to construct a model that attempts to describe an individual. Each individual may require a separate model, however, which is expensive. It is possible to have variants of model types and hope there is only a small number of variant types. The assumption is that there are only a few prototypes of writers. Another assumption is that a "top-down" analytic approach to composing processes will ultimately meet with a "bottom-up" synthetic approach. These researchers perceive the 2 approaches as complimentary, with the advantage of a "top-down" approach being that it is relevant to a real writing situation since it looks at the complete act of writing first, going from the complex to the simpler subprocesses, and with the "bottom-up" advantage being the ease of getting at fundamental processes with a going from the simple to a complex approach.

The fifth decision, to divide the world into psychologically relevant pieces, rests on other assumptions. The first piece of the world, the writer's long-term memory, is based on an assumption that there is such an entity and that it is

a factor in the composing process. Another assumption is that past experience, a piece of the world, can be gotten at by analyzing the protocols and is an important factor in the composing process (Hayes, 1978).

Six of the 10 existing studies on the composing process have been selected for critical review as major representative studies. The selection was based on each study's research design, and is composed of examples of case studies; group comparisons; samples of second-grade composers; high school composers; adult composers; thinking aloud composing; silent composing; interviews; coding systems; models of the average good writer and models of the individual good writer. The studies also illustrate various approaches to the composing process.

A basic issue in designing research on the composing process is the source of data. How in any composing process research is the data going to be obtained? How will the researcher know what mental processes are going on as a person composes? Will he use "thinking aloud" protocols or silent composing protocols? Will he use interviews: If so, what kind and how many and how long will they be? Will he

directly observe writing behavior? If so, what kind of a coding system will he use? Will he examine the products of the composing process for implicit information about the process? It is desirable that the source of data in descriptive observation be as systematic, objective, valid, and reliable as possible. Many investigators chose case studies resulting in problems of experimenter bias or process of measurement, reliability, and validity. Other investigators chose quasi-experimental designs with the same problems.

Another basic issue in composing process research is the choice of sampling. This is because we wish to generalize to other groups to a relatively large population of which the group observed is representative. The selection of a sample inevitably implies a definition of a population, so it is necessary to consider whether the sample is likely to be representative of this population and whether this population corresponds to any actual existing population of people or schools. The questions are ones of internal and external validity.

In the 6 major studies on the composing process selected, the aims, data gathering procedures and sampling procedures

have been described, the findings as well as the interpretations, the design and rationale of the research are critically appraised and related to cognitive processing theory. An overall evaluation is added. A concluding discussion attempts to put together some of the main issues brought out in the separate studies. The paper is organized according to method of obtaining data on the composing process: the thinking aloud method or the silent composing method. The paper is intended as a contribution to the state of knowledge of research on the composing process.

I. THINKING ALOUD COMPOSING METHOD

The Emig Study (1971)

Aims

The major aim of this study was to examine the composing process of twelfth-grade writers using a case study method. A basic premise of this study is that there are elements, moments, and stages within the composing process which can be distinguished and characterized in detail. The category system used to delineate the components of the composing

process was derived inductively from an extensive analysis of the 8 case studies. The components of the composing process were identified as Context, Nature of the Stimuli, Prewriting and Planning, Starting, Composing Aloud, Stopping, Contemplating the Product, Reformulating, and Seeming Influence on Writing by Teachers of Composition.

Data Source

Eight twelfth-graders of above average and average ability were asked in 4 sessions each to give autobiographies of their writing experiences and to compose aloud 3 themes in the presence of a tape recorder and the investigator. Interviews were used at each session with questions about any prewriting and planning that was done in the period between the weekly sessions; these recollections, with expansions and elucidations gained by investigator questioning were also recorded. The responses were unstructured responses. The subject sat in a position where it was possible for the investigator to observe and make notes of his actions. Observed behaviors were divided into silent activities and vocalized hesitation phenomena. The 3 kinds of silent activity are physical writing, silent reading and "unfilled"

pauses. Vocalized hesitation phenomena or filled pauses consist of filler sounds, expressions of feelings and attitudes, digressions, and repetition of elements.

Sampling

Eight 16 and 17-year-old secondary school students served as subjects: 5 girls and 3 boys. The subjects volunteered for the study. They came from various types of secondary schools in the greater metropolitan area of Chicago: (1) an all-white upper-middle-class suburban high school; (2) a racially and economically mixed high school in a small city north of Chicago, often named among the 10 best high schools in the United States; (3) a racially mixed and lower-middle-class suburban high school in an industrial area west of the city; (4) a racially and economically mixed comprehensive Chicago high school; (5) an almost all-black ghetto school in Chicago; and (6) a private, university-affiliated laboratory school. Five of the 8 subjects were above average intelligence according to school records available for 3 and scores of 670 or higher on the College Entrance Board Examinations for 2 subjects.

Results

The data revealed that for American secondary school students in this sample, the sponsorship of these two modes of composing is divided, with extensive writing (impersonal-communicative) occurring chiefly as the school-sponsored mode; and with reflexive writing occurring chiefly as a self-sponsored activity of students. The data also reveal that the composing process for the reflexive and extensive modes differs in length and in the clustering of components. The process of reflexive or self-sponsored writing is a longer process with more portions; students writing reflexively often engage in quite long prewriting activities; they re-formulate more; starting and stopping are more discernible moments in the process; and the more aesthetic contemplation of their own product of writing sometimes occurs.

Evaluation

This study is significant because it was the first one to try to characterize the composing process. It is not a psychometrically-sophisticated account of how all twelfth-graders compose. It is a case study, a pre-experimental design with weaknesses in history, selection, and interaction

of the selection and treatment; therefore, it has sources for internal and external invalidity in these areas. Emig points out that the study introduced the case study method, a unique effort to utilize case studies in an experiment in capturing a process in a process. The case study provided humanistic data, the kind of data other inquiries into composition had not yet elicited with its chief value the assumption that persons rather than mechanisms compose. She considers this kind of systematic collecting of information requisite to future empirical investigations in this unexamined field.

The sample of students as well as the sample of writing they produced was far too small and skewed. The sample does not define the population. Emig's purpose was to examine the composing process of twelfth-graders. The students who volunteered are not representative of twelfth-graders since the sample consisted of no below average students, only 3 average students and 5 above average students. All but 1 subject attended high schools with an enrollment over 1,400 students which means the experiences in the English programs would be different from twelfth-graders in small, rural

schools. One subject attended a school with an enrollment of 615, but it no doubt was the university laboratory school, which is certainly not a typical high school.

The study was confounded by situational variables. Since the experimenter tried to give stimuli to elicit reflecive writing twice unsuccessfully, there was no doubt some experimenter bias in the taping sessions. The subjects were volunteers and therefore there may be a Hawthorne Effect, too. The lack of reflexive writing could be a result of the wording of the stimulus. Subjects may not have understood the intent of the investigator's words, "Write about a person, event, or idea that particularly intrigues you." If the added words, "you may use first person if you like," were used, the results may have been different. Reformulations for extensive writings were few because the writing situation didn't allow the time for them.

The composing aloud method used to externalize the behavior was found to be a difficult, artificial, and distracting behavior for the subjects. How much this method reflects actual inner processes is doubtful. The reception of the composing aloud assignment, which is also a text

consisting of all remarks not actually a part of the theme assigned, is affected by the student's ability to enact the task, his motivation to enact the task, and his attitude toward the task. Subjects may not be able to compose orally or may not report accurately. These factors make a difference in the analysis of the protocols and the findings.

There were other problems with the study, too. The time span between the sessions was too long--1 week and sometimes 2 weeks--for accurate self-reporting of prewriting and planning activities. Remembering well enough would be problematic, so the sessions should have been closer together. The study did not specify how long the sessions were. No data were quantified or subjected to tests. No comparisons among subjects were attempted except for a table comparing high school size. The findings about the amount of reflexive writing is suspect since only 3 boys were in the sample and only 1 of them submitted the assigned reflexive writing. The assignments that were given did not cover enough of the different genre of writing. Different modes or genre of writing have different degrees of complexity with narration at one end of the continuum and argumentative essays at the

other. No allowance was made for this fact in the theme assignments. With only 8 students in the sample, the findings could also be explained by the personality types of the subjects. The students were above average in maturity, no doubt, since maturity and high intelligence are highly correlated and perhaps they perceived personalized writing as immature writing. Another limitation was not correlating the data collected with any outside objective measures of writing ability such as the STEP or SAT writing tests.

Emig did focus on the act of writing but the study seems more product-oriented than process-oriented and did model an individual writer, but her individual models would not be examples of prototype models of individual writers. Her study would not give the information necessary to build an adequate model of the composing process or a subprocess. We do not know how the processes are sequenced for the parts of a whole theme and how simultaneous processes interact. Although Emig states that some processes are recursive, her model seems to be a linear or "bottom-up" model. The structure of the composing sessions and kinds of questions asked indicate that there is a progression from prewriting to planning to writing

to reformulating and that students do each step only once. She does not show how students handle the multiple constraints of grammar, correct tone, lexical choice, accuracy of meaning, and transitions when they construct a sentence. Her study does not have a component covering writing and rhetoric, an important component of the composing process. No attempt was made to relate prior experience and prior knowledge to the composing process. Because of the limitations of the methods used to gather data, the sampling, the lack of a description of the mental processes used in composing and of the functional relativity between the parts, the study is only partially successful in examining the composing process of twelfth-graders.

The Perl Study (1978)

Aims

The aims of the study were to describe what was happening when people wrote and to account for every minute of that process. The study intended to concentrate on the process of creating and the process of elaborating meaning, creative discovery of meaning. No information was available as to how

the dependent variables were quantified.

Data Source

The investigator worked with 5 students. Each of the students met for 5--1 1/2 hour taped sessions with the investigator, composing aloud, that is, articulating, as much of the flow of his thinking as he could. Each subject wrote on 4 different assignments, 2 in the extensive mode (impersonal, expository style) and 2 in the reflexive (personal style, touching on writer's own experience). One additional session consisted of an interview on perceptions and memories of writing and writing instruction.

The investigator coded each of the operations, viewing each of the separate features of the composing process and the manner in which each related to the whole in order to document what happens as people write. This graphic dramatic evidence was deemed necessary for replication so that research on composing could move from exploratory studies to more controlled studies necessary to insure the value of procesing studies. The graphic display composing style sheet made it possible to lay out specific observable behavior sequences in such a way that if patterns exist within a process or

between one process and another, they would become apparent. The coding scheme was an attempt to reconstruct the composing process as it seemed to be unfolding. Each subject had 4 of these charts making it possible to determine if he exhibited familiar patterns, if he used the same strategies or exhibited the same behaviors in each session or totally different ones and how the different topics affected these patterns. With 5 students and 4 occasions the investigator would be more likely able to determine whether patterns are consistent through a range of students. The data sources, then, were the products of the assignments, the taped oral comments and explanations of the composing process, the taped oral interview on the past history of writing experiences, and the direct observations of behaviors coded on the style sheets.

Sampling

The subjects were freshman students at New York University (CUNY) enrolled in a class for basic writers. No other information about them is available.

Results

Perl focuses on retrospective structuring instead of

projective structuring. Projective structuring refers to the way writers shape discourse structure because of some notions they have about audience--they have reader-based goals. Retrospective structuring refers to the aspect of the process where a writer takes the unformed pieces and gives these pieces explicit form. Structuring some implied sense into some explicit form is what comprises the art of meaning-making and what provides for discovery in composing. The conclusion was that writing is a process of construction and discovery of meaning. It is creative in that no one knows precisely what shape a piece will take and only after it is shaped does he know whether it belonged in an emergent piece of writing.

For these unskilled writers, no matter how many times they reshaped their units, they believed that as soon as they managed to get a few words down on paper or a piece of discourse finished, it needed to be "factory perfect" with no rough edges and no flaws. As they worked to make it perfect, they edited the discourse, which inhibited the flow of composing itself. The premature editing obscured from view the possibility of creating new pieces that might fit better than

the ones they were struggling with. In composing, words, sentences, and paragrapsh are not prepackaged, so writers cannot pull out from their minds fully formed pieces to see how they work together. Each piece of discourse is made as the writer goes along, and he literally gives pieces shape through the process of writing. Their emerging form helps structure the shape of other pieces not yet shaped. Any piece added has the property of reshaping all that has come before, so the original boundaries of the piece of discourse may change. The writing process is like creating the parts, fixed and whole, at the same time. When the writer uses his energy to edit at this point changing a word or punctuation, for example, he interrupts the composing process. The reason for editing is the school's emphasis on form. The editing procedures taught in school to improve form thwarts the very process students need to engage in, in order to produce written products.

Another finding was that even basic writers have definite, stable composing processes to start, stop, or sustain writing and that the behaviors these strategies initiate fall into consistent and recognizable patterns. This consistency

suggests most of them have greater internalizing processes than had been suspected. There is very little that is random in what they write or how they write. These writers were not beginning novices at writing and did not use a straightforward linear process with one bit of discourse fitting neatly into another preceding it, but rather, used a recursive process with as many backward as forward movements.

Evaluation

The study is a pre-experimental one, but it is sophisticated because of its elaborate coding scheme for many complex writing behaviors. The coding scheme makes quantifying possible, but the scheme is a reduction of the process. Perl recorded gross, global behaviors that she thought were salient as she observed what people did when they wrote. The study suffers from subjectivity in the coding of behaviors and in interpreting the protocols and interviews; no reliability check was given or available for the 1 investigator who was used. The composing aloud method is based on the assumption that oral and silent composing are alike or very similar and that self-reporting is accurate. When composing aloud, the subjects are only saying an

approximation of first things that come to mind. Many things never get said, so the investigator must make inferences about what's going on underneath. The quality of the inferences made depend on the inferencing ability of the investigator. Perl claims that composing aloud becomes more comfortable and feels more natural as the sessions progress and that composing aloud is not like speech but comes out looking like writing, but just slowed down writing. There is a question of how valid the first sessions were then, when composing aloud was uncomfortable and unnatural.

The coding scheme is very complicated. The key to the Composing Style Sheet showed 33 different behaviors being recorded. As the number of items coded increases, the accuracy of the investigator usually decreases since there are too many behaviors to watch, so the study no doubt suffers from this problem; however, no information was available as to the reliability of the coding scheme.

No information was available about the subjects selected for the study, either. It is not known if they were volunteers or whether any incentive was given them to participate in the study or whether they were highly motivated or not.

It is not known how they were selected for the basic writing class. If a placement test was used, it may not have included a writing sample. The students may have placed there because their low intelligence caused a low test score, or because they received inadequate teaching of writing skills or inadequate practice or because they were developmentally slower in cognitive ability than other students. Knowing why they were basic writers is important in defining what population they represent. What does basic mean operationally? The findings might differ if the basic writers were differentiated more precisely.

The study is successful in characterizing the composing process precisely and characterizing the process of discovery and elaborating meaning. It focuses on the act of writing in a holistic, "top-down" method, attempts to model the unskilled writer, describes some of the dynamic processes involved in composing, attempts a complete model of the invention or prewriting-planning subprocess of composing but does not deal with pieces of the world such as long-term memory, prior knowledge, or rhetoric. It is a writer-based model and not a reader-based model.

The Flower and Hayes Study (1978)

Aims

In this study the researchers try to identify the cognitive processes going on when writers identify and deal with their audience, and they try to determine how people represent and define to themselves the rhetorical problems they then go on to solve and try to determine what really happens when one discovers.

Data Source

Flower and Hayes studied thinking aloud protocols, taped transcripts of expert and novice writers. Both groups had the same problem given to them to solve in a writing assignment. A typical subject appeared 6 different times at an office at a given time. He knew ahead he would write but did not know the topic or audience. He was given an envelope containing the writing assignment with topic and audience. He might have an assignment such as "Write about your job for Seventeen Magazine," or "Write about abortion pro and con for Catholic Weekly." The subjects turned on the tape recorder and composed out loud, trying to articulate everything going on through their minds, including stray ideas and crazy

thoughts, as they composed, not analyzing. The tape was turned into a transcript and analyzed to get a composite picture of the rhetorical problem based on all the things the subjects considered.

The rhetorical problem was broken down into parts to see what parts the subjects actively represented and used. One part is the situation the writer is faced with--the givens outside of them. The other part is the goals they create for themselves, where they actively represent what they are going to do to their reader--and the goals they represent for making meaning and the goals for what the text will look like. The researchers then set up cells on a sheet and coded every instance where they saw something going on dealing with the rhetorical problem such as representing an audience, refinement, and the reader. As they read through the protocol, they made comments and charted where this was going on. Subjects were counted for elaborating and drawing inferences. The protocols proved to be a rich source of information.

Sampling

The subjects were novice writers, students attending

the Communication Skills Center at Carnegie-Mellon University and expert writers, people who attended a writing seminar on rhetoric (sponsored by this university) and who had to submit samples of their writing in order to be accepted for the seminar.

Results

Although no information was provided as to how these results were obtained, the authors claim their findings showed that writing has to be organized around a central goal; the writing process is hierarchically organized; some writing processes may interrupt other writing processes over which they have priority such as editing taking over the generating of idea process; writing processes may be organized recursively; poor writers give themselves a flat, under-developed representation of the problem while good writers represent a problem in depth and breadth; thinking about goals generated new ideas; thinking about "what am I going to do to the audience" is more productive then just analyzing the audience; novices represent the audience minimally and in a stereotyped fashion while good writers build a unique representation of the audience and goals; good writers respond to all aspects

of the rhetorical problem across the board; novices see only a paper problem, how to write an essay, instead of a rhetorical problem; discovery does not result from just waiting but from insistently, persistently and energetically working and thinking; ideas are made, not found.

Evaluation

It is possible that the novice writers represent only 1 type of novice writer. Carnegie-Mellon is a technically-oriented university, and the students attending are technical students, students with possible built-in negative attitudes about writing. The novice writers were probably exceptionally bright but fearful of writing since most technical students have had limited experiences with producing written texts. The novice writer at a community college or in high school no doubt would be a different type in regard to basic language competency and intelligence. The pool of expert writers used for the study were biased. They were attending a seminar on rhetoric so naturally would be biased in favor of using rhetorical principles in a writing situation. Expert writers in another university or expert writers not attending a university might not be as audience and goal-oriented as these

experts were. They might be more writer-based.

The composing aloud protocol method changes the writing process in some ways. According to the authors, the method bothered some subjects to the extent they couldn't write for a whole week after the experience. The method does, however, reveal much information, and some subjects do adjust to it and remark that it is very revealing to themselves and worthwhile (Flower and Hayes, 1979), but the use of the protocol method raises an interesting question. What about the body of tacit knowledge the subject has that is never articulated about the rhetorical problem? The investigators coded only what was explicitly stated about the rhetorical problem, yet no doubt many people have a great amount of information about rhetorical problems in the form of stored problem representation in memory, well-learned schemata about audience needs and writing forms for letter-writing (thank-you notes, for instance), based on past experience. Some subjects are more extroverted and more verbal so would tend to articulate more of their rhetorical knowledge than the quiet, shy subjects. The protocol situation itself is a new experience for the subjects, and they have no stored

representation of it in memory, no schema for it. It is a unique situation and they must build a new unique problem representation for it. Some subjects are probably better able to do this than others in the limited number of sessions of the study. The ability of the subject to compose aloud and the processes he uses will affect the findings of the study.

The researchers in this study focused on the mental processes in the act of writing, the subprocess of discovering and problem-solving. They attempted to model the good and poor writer using these processes in a holistic manner. They divided up the writing tasks and tried to build a model for these writing tasks. The study was successful in achieving most of its goals and the goals of a cognitive processing model.

II. SILENT COMPOSING METHOD

The Graves Study (1973)

Aims

This investigation sought a profile of 7-year-old

children's behavioral patterns associated with the writing process, in order to formulate instructional hypotheses and merited research directions.

Data Source

Data were collected from: (1) the logging of 5 categories of information about composing from the writing of 94 children; (2) the naturalistic observation of 14 children while they were writing in the classrooms; (3) the interviewing in 4 different sessions of 8 case study children as to their concepts of "a good writer"; (4) the gathering of full case study data about 8 children through parent interviews, from testing and assembling of educational-developmental history, and by the extended observations of the children in several environments.

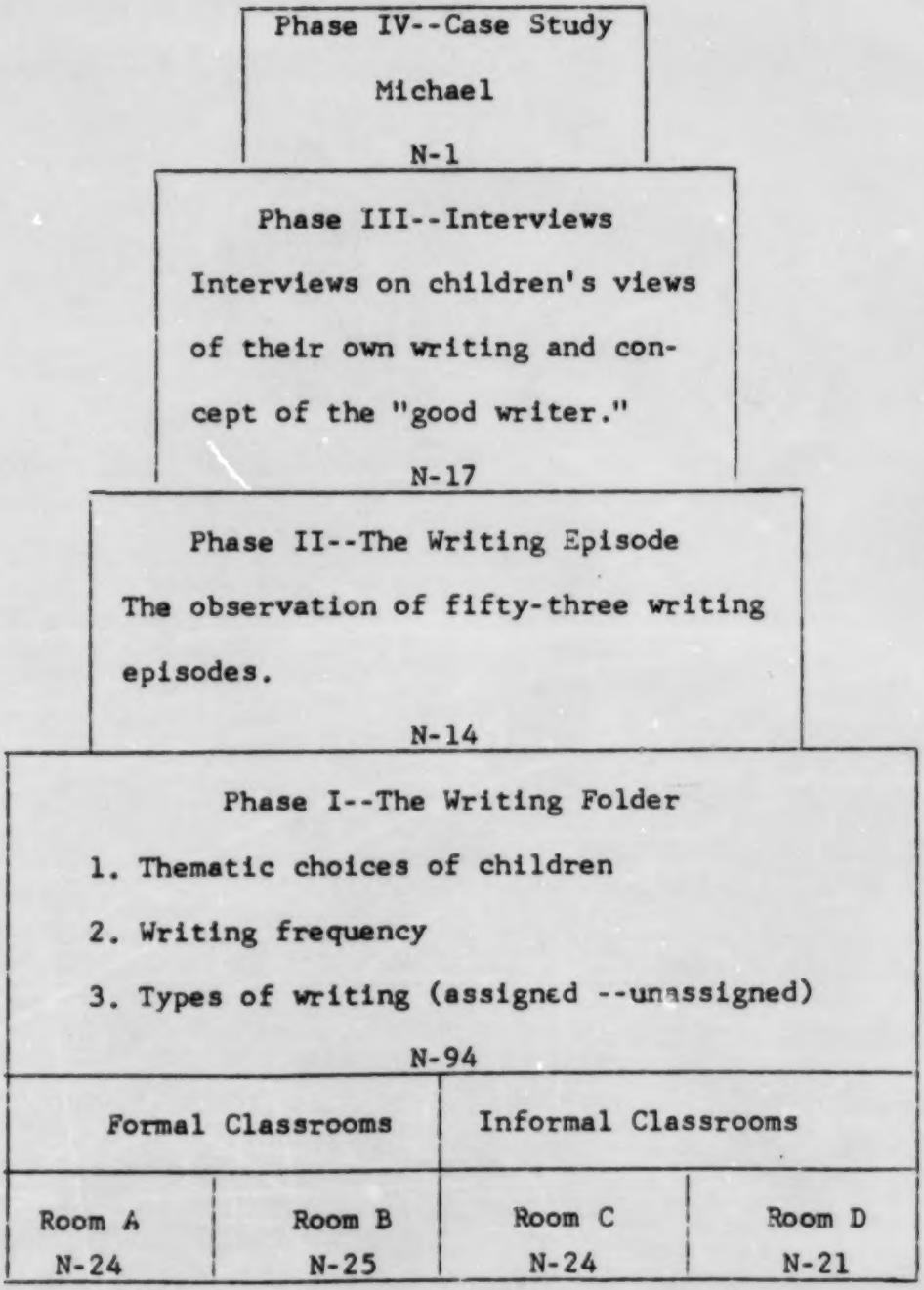

FIGURE I

Study Phases and Procedures

Sampling

Eight case study children were chosen as the focus of a 5-month's investigation. The children chosen were considered by teachers and administrators as representative of "normal" 7-year-old children; thus pupils of unusually high intellectual capacity and those with learning or emotional problems were excluded. The children, 6 boys and 2 girls, were taken from 2 formal and 2 informal second-grade classrooms, 2 from each classroom. The criteria for the classroom concerned the degree to which children were able to function without specific directions from the teacher and the amount of choice children had in determining their learning activities. Secondary focus was on the gathering of data from larger groups in the same 4 classrooms.

Results

The case study approach involving extended observations of the child in the classroom and home, interviews of the child, parents, teachers, and principal, testing and assembling of an educational-developmental history, was determined as an effective procedure for identifying variables related to writing processes of children. In a broad

interventive-type inquiry involving many children such speculation would not have been possible. Many of the variables discussed in larger group findings became apparent as a result of the intensive case study such as use of first and third person, identification of secondary and extended territoriality in thematic choices, the identification of the prewriting, composing, and postwriting phases in the writing episode, the identification of components making up profiles for assessing developmental levels of children. Large group data provided a means of additional testing of the suitability of certain research hypotheses and directions. Combining all of the 53 writing episodes made it possible to develop and hypothesize about the range and relationship of the developmental variables deemed significant to the writing process. The larger group data confirmed the significance of assigned and unassigned writing and thereby contributed to the recognition of the need to pursue the area with the case study children. The larger group data made it possible to view the differences in boys' and girls' writing shown in case studies with greater objectivity.

Writing frequencies, thematic choices, use of assigned

and unassigned writing, and responses to the question on the "good writer" in larger groups are examples of these differences which were observed. Other significant "findings" claimed by the author were that at any given point in a writing episode, many variables, most of them unknown at the time of composing, contribute to the writing process and that children write for unique reasons, employ highly individual coping strategies, and view writing in ways peculiar to their own person. In short, the writing process is as variable and unique as the individual's personality.

Evaluation

The study contributed important conclusions about use of the case study method and its importance for large group data and experimental research to follow the case study. The study had an effective design with its range from large groups to case studies and formal to informal classrooms. It gathered data from a variety of sources, used broad samples of writing, and used naturalistic observation. Therefore, there was a range of cross validation of data to support the findings and, thus, to add power to the research recommendations and instructional hypotheses posed. This

approach made it possible to follow findings from the several larger settings to an individual case and conversely, from the case and/or small group findings to all-class profiles and to the entire group of 7-year-old children studied.

The procedure used in the study required 250 hours spent observing children. There are few researchers who would have the time to replicate this study. The observations of the writing episode focused only on the physical behaviors of the student as he was observed in the prewriting phase, the composing phase, or the postwriting phase. Examples of notations on the observation Writing Episode sheet such as "Gets up to get a dictionary," "Copies from dictionary," "Stops," "Voices as he reads," and "Rereads," and examples of the observer's objective during the composing phase such as "To determine the child's understanding of the resources available for spelling" help indicate that the observation is superficial.

The investigator has a good design but he is asking the wrong questions. Instead of being concerned about the mental processes used in composing, he is interested in how the child determines how to spell a word. The observer interrupts

the children often as they are involved in a writing episode to ask, "Tell me what you are going to write about next." The observer was a distraction to the children and may have confounded the results because of the artificial context of the writing situation.

The developmental factors such as child's sex, use of language, and problem-solving behaviors are involved as a child writes and interacts in various ways to produce 2 distinctive types of writers, the reactive and reflective. These are borrowed terms, and the author gives no indication of how they are measured in writing. The observation sheets, however, have no portions devoted to notations about language and problem-solving behaviors relating to composing. The model Graves is using here of the composing process is a "bottom-up" model, a serial model in which a child prewrites (usually draws), composes, and then does something else--but not revising or correcting. No attention is given to reformulation or the dynamics of creating a piece of discourse, how the parts interact and relate to the whole.

No reading test was given to the children and yet the observer notes the children reread. The child's reading

ability will certainly affect what he writes and how he writes, his composing processes, but this part of the composing process was not considered. The reactive writer was most often a boy and the reflective writer was most often a girl. The characteristics and behaviors summarized in the following statements indicate the need for a reading test and the relating of reading to the composing behaviors of children.

1. Reactive: Children who were identified as reactive showed erratic problem-solving strategies (but we aren't told how this was measured), the use of overt language to accompany prewriting and composing phases, isolation that evolved in action-reaction couplets, proofreading at the word unit level, a need for immediate rehearsal in order to write, rare contemplation or reviewing of products, characterizations that exhibited general behaviors similar to their own, a lack of a sense of audience when writing, and an inability to use reasons beyond the affective domain in evaluating their writing.

2. Reflective: Children who were identified as reflective showed "little" rehearsal before writing (no

quantification was given), "little" overt language to accompany writing, periodic rereadings to adjust small units of writing at the word or phrase level, growing sense of audience connect with their writing, characterizations that exhibit general behaviors similar to their own in the expression of feelings, and the ability to give examples to support their reasons for evaluating writing.

In addition to explaining and studying the relationship of reading ability and the composing behaviors, the study should also show the relationship between speech behavior and composing behavior. The child's ability to remember, his perceptual and cognitive development would all be related to composing behaviors and should be considered. The study does not focus on the mental processes of composing and attempts to model the individual writer from the case study and an average model from the group study. The study does not model the writing process, it uses a bottom-up approach, and it does not divide the composing process up into writing tasks. It does not really get at what children do when they compose. However, it is an example of design with cross-validation techniques that could be used in other composing process

studies.

The Stallard Study (1972)

Aims

Stallard's purpose was to identify what behaviors and cognitive processes characterize the good writer in senior high school prior to and during the act of writing. He also wanted to know if the behavior of good senior high school student writers would include evidence of consideration of such things as structure, organization, style and diction, or, on the other hand, if the evidence would suggest that the writing they did was largely independent of conscious consideration of such elements.

Data Source

The data collected came from essays written in response to an assignment by the researcher, all prefiguring done for the essays (no erasing was permitted once it was written down), individual interviews conducted immediately after each subject had finished writing, and notes from the investigator as he observed the subjects writing. During the interview the students were asked about the things they

remembered consciously attending to and feeling concerned about while writing.

As each student wrote, one at a time in the presence of the investigator, he observed their behavior without the student's being aware he was observed. Behaviors which were observed during the study included the following: (1) planning behavior, (2) revision behavior, (3) rate of writing, (4) audience awareness, (5) consideration of purpose, (6) stylistic concerns such as paragraph development and total organization of the behavior, (7) attitudes toward writing (no information was provided about the reliability of the attitude observations), and (8) the practice of stopping to read at intervals during the process of writing. Motivation to write well was provided by telling the students that selected papers would be published in the study.

Sampling

The investigator selected 15 good student writers of senior standing in a Virginia public high school. Good writers were identified on the basis of scores on the STEP Essay Writing Test; the 15 selected were the ones who ranked the highest on the test, about 1/10 of the senior class.

The high school was a typical Virginia public high school on the outskirts of a small city. The second group was selected at random from the same class. They served as a comparison group. This group also numbered 15. A random selection was used for comparison rather than a group of poor or below average writers. It was felt that differences that did show up between the good and the "average" writer would be more striking than differences between good and poor writers, but no explanation was offered as to the reasons for this idea.

Results

The analysis showed that the good student writers spent more time contemplating the writing assignment than the randomly selected writers in both the period of prewriting and writing. The good writers spent a mean time of 40.8 minutes writing their papers, compared to 22.6 minutes for the randomly chosen writers. The rate of writing was 8.73 words per minute for the good writers compared to 13.47 words per minute for the randomly selected group. This difference proved to be significant at the .01 level of confidence. In relation to the length of the essays, it was

shown that the good writers were slower writers, writing almost half as many words per minute as their randomly chosen counterparts.

In terms of revision, the good student writers changed more words as they wrote. Most of the changes were single word changes, but a significant number of multiple word changes occurred, also. While good writers changed significantly more paragraphs than the writers chosen at random, the total number of paragraph changes is small when compared to the total revisions made. The good writers made many of these changes during the process of reading their papers at intervals during the process of writing. The good student writers frequently stopped writing to read over what they had written. On the basis of evidence derived from this study, writers selected at random seldom engaged in such activity.

The good writers were concerned about having a purpose in their writing. They reported that they gave thought to purpose before they wrote and while they were writing.

Some behaviors were demonstrated by both groups: (1) evidence of some concern for spelling revisions, (2) an

expressed concern for mechanics of writing in general, (3) a lack of concern for identifying a particular audience for their writing, and (4) a lack of concern for any predetermined structure of paragraphs or of the total essay.

Evaluation

This study is an attempt to characterize the cognitive processes of composing by using comparison groups instead of a case study. A pilot study was conducted in 2 other Virginia high schools several weeks prior to the final study. The pilot study provided the investigator with indications of potential problems with data collection and helped identify the type of behavior that could be effectively observed. The pilot study proved that large groups of students cannot write at one time and be videotaped in the process because of equipment and size of rooms problems and that interviewing immediately after a group writing is impossible. A delay of several class periods or days was necessary before a student could be interviewed about what he did when he wrote the paper. The pilot study pointed out the problems in using large groups in a quasi-experimental design to investigate composing processes. A group of investigators would be

necessary to make immediate interviewing possible. Immediate interviewing is necessary to prevent memory problems.

Data was quantified and an analysis of variance performed for selected interview data. Using selected interview data cause a real problem with parametric statistics. Revision of the first draft and audience awareness differences were significant at .01 level as were multiple word and single word revisions. The random sampling from a senior class of 150 students minus the 15 good student writers was from a total of 135 students, not a very large population. Because of the large numbers of students to be interviewed on an individual basis, 30 students, the interviewer could tend to become more proficient or more bored as the experiment proceeded. Different amounts and kinds of notes might be taken and different cues might be inadvertently provided to the subjects, factors which would affect internal validity.

The wording of the assignment was biased in favor of the good student writers. The assignment was worded, "In a brief essay that represents the best writing you are capable of, defend your position in regard to some event or issue in the

news during the past 4 months. If you prefer, make up your own news event or issue and defend your position regarding it." The good student writers would have a good vocabulary and would have no problem comprehending the sentences, but an average student or one below average would not understand the phrase, "defend your position" or the words "event" or "issue." The assignment wording is highly abstract and complex. It should have been reworded. The assignment is also developmentally too complex. This is an argumentative essay, the most difficult of all expository writing. Another expository assignment on a lower developmental level should have been used.

The interview required unstructured responses necessitating subjective interviewer interpretation. No information was given about the number of people reading the essays. The results would be more valid if 3 or 4 different persons read the essays and observed the subjects. Training sessions for observers and essay raters are necessary for interrater agreement.

Some of the findings in this study could have other explanations. The concern for mechanics by both groups could

be explained by an overemphasis on mechanics at that particular school. The selection of students should have come from a variety of schools, not 1 particular high school, so it is hard to generalize the findings of the study to all good high school writers. The finding that a major behavioral characteristic of the good writer is a willingness to put forth effort to make communication clearer to a reader could be explained developmentally. Kroll (1978) found that lack of audience awareness is an egocentric problem that extends into adulthood for writers and sometimes egocentrism pays off.

Stallard's study focuses on the composing process, but it does not model the composing process. It does not address itself to processes that interact simultaneously or how good students handle all the multiple constraints. It does focus on some of the constraints such as transitions and organization and mechanics. It also addresses the problem of writing and rhetoric. The study does not model the individual writer. It has an average model of a good writer which may not actually represent any real person. It tries to specify the mental processes used in composing in a holistic manner but does not break the composing process down into writing

tasks (nor consider the subject's prior experiences). The investigator unravels many of the processes followed by good writers and the findings are important for teachers of composition.

The Pianko Study (1978)

Aims

The purpose of this study was to characterize the composing processes of college freshman writers and to analyze certain dimensions of composing to discover differences for particular categories of college freshman writers--remedial vs. traditional, typical college entrance vs. adult, and male vs. female. The features considered are those elements, moments, stages, behaviors, and prior experiences which shape the composing processes of the college writers observed in this study. The investigator wanted to determine if different groups of college writers follow the same patterns as those of younger writers and to see if there are other ways of characterizing the writing processes for different types of students.

Data Source

Five writing episodes were scheduled, 1 per week for each of the 24 subjects in the study. For each episode, the subjects were asked to write a 400-word essay and told they could take as much time as they felt necessary to complete the assignment as long as it was completed in that afternoon. In place of the first 4 assignments, students had the option of writing on anything, in any mode of expression. The assignments were designed to elicit a piece of writing in each mode--description, narration, exposition, and argumentation. Each student was observed and videotaped at least once. During the observations, the length of time which elapsed for certain behaviors as well as the number of times certain behaviors occurred was noted.

Following an observation, immediately after the completion of 1 of the assignments, each student was questioned about the behaviors exhibited during the composing experience to elicit the student's views on the causes and meaning of certain behaviors. The student was questioned about the general attitudes and feelings which prevailed during the entire writing session. A Writing Behavior Question Guide,

which probes the subject for self-awareness and which elicits reasons for and causes of exhibited behaviors, was designed for this type of interview.

To discover other factors influencing the process of composing--general attitudes, feelings, self-described behaviors, and post writing experiences--each subject was interviewed in-depth concerning past and present writing experiences with writing. For this interview, another guide was designed--Background Interview Guide. All the interviews were taped and transcribed. The writing was done in a single, enclosed room and other students were present (1/3 of the students in the study were in the room writing during each scheduled episode). The students knew their compositions would not be graded. All pieces of writing, including scraps, outlines, and drafts, were collected.

Sampling

Of the 400 students enrolled at a community college in a freshman composition course, 24 were randomly selected as subjects. These 24 students were sub-grouped into 6 pre-determined categories to allow an analysis of a cross-section of the school population: class status (traditional vs.

remedial); age (typical college entrance age--under 21 vs. adult--21 and over); and sex (male vs. female). Of the 24 randomly selected volunteers, only 17 remained through completion of the study. Ten were remedial and 7 were typical college age and 10 were adults.

Results

The findings from the study were as follows: Writing was not seen as playing an important role in the students' lives. There was little, if any, commitment to it; it was something to be carried out as quickly and as superficially as possible (Pianko, however, gave no explanation about how commitment can be measured by time). There seemed to be very little gained from the composing act except meeting a school requirement; and even if students wished to be more committed to the writing, the constraints placed by the school on the writing environment precluded the possibilities for greater elaboration, commitment, and concern. School-sponsored writing, especially when done in one class period, does not permit sufficient time for a regrouping of energies and thoughts. There seems to be a depth of insight in better writers which is behaviorally and attitudinally absent from

from less successful writers. Since traditional student writers did more writing in school, saw more writing being done by family and peers which was not related to school, and did more self-initiated writing, they had evolved a fuller sense of commitment to and understanding about writing. (Again, Pianko did not indicate how one can measure this fuller sense of commitment and understanding.) It appears that once adulthood is reached, age (within the range observed in this study) is no longer a determining factor in the writing process.

The differences in the composing process between the male and female groups basically fall into 2 categories: consideration of elements which influence the outcome of the product and the role of writing outside the school. More females tended to be concerned with stylistic elements and with establishing specific ideas prior to writing; more females had positive feelings about their writing, did self-initiated writing, and felt writing to be of importance. Males tended to be less conscious that there are elements in the composing process to consider, and more males seemed to avoid writing as an activity both in and out of school.

The findings confirm on the community college level that the factors which distinguish the more reflective writers from the poorer writers are basically the same as those found in previous studies dealing with younger age groups.

Evaluation

This study was a comprehensive, sophisticated study of the composing process. Using the dimensions of the composing process: prewriting, planning, composing (writing, pausing, rescanning), rereading, stopping, contemplating the finished product, and handing in of the product as well as the time spent for certain behaviors and the number of times certain behaviors occurred, a large number of dependent variables were examined and similarities and differences among the different types of students were studied. This was a complex study well-designed and much more inclusive than previous studies. Pianko did an analysis of variance for 22 dependent variables for class status groups, age groups, and sex groups.

It is interesting that this study did not use the case study method or composing aloud method although Janet Emig was one of the investigator's advisors. (One wonders whether Janet Emig has changed her opinion about the value of the

case study and composing aloud approaches.) The finding that the entire sample was not committed to writing could be explained by the fact that the sample selection was from a community college, a special population. In a study of comprehension of connected discourse using samples from Cornell University and Auburn Community College, Marshall and Glock (1978) concluded that because the patterns of recall were so different for the 2 groups of subjects, they represented 2 different populations. The Cornell subjects came from a population of truly fluent readers, and the Auburn subjects, excluding the few who performed as well as the Cornell subjects, represent a population of not-so-fluent readers. If Pianko had compared subjects from a university like Cornell to the subjects in her selected community college, no doubt she would have found a fluent writing population at the university and a not-so-fluent writing population at the community college. It is usually accepted that people don't like to do what they cannot do well. The lack of commitment Pianko found could be attributed to the lack of fluency in writing for a particular population.

In her "too small" sample, 10 of the subjects were

remedial in contrast to 8 traditional students, a bias towards remedial students and a lack of commitment and negative feelings. In a community college, there often is very little to distinguish a remedial writer from a traditional writer. Many traditional writers would be borderline cases. No pre-test was given such as the STEP test to distinguish writing ability. Although the STEP test may not actually be an objective test since the products are evaluated subjectively, it is better than no pre-test. Placement tests given at community colleges are not usually valid or reliable so it is difficult to know what a remedial writer is or a traditional writer is.

Pianko's study does concentrate on the composing process but does not really model the composing process adequately. She does not show how writing an essay is a collection of processes for units of a larger discourse. She does not show how the past environment is important for the text produced so far and that it becomes increasingly more important as the process goes on. Her model appears to be a non-recursive one; a linear model using a "bottom-up" approach. The individual writer is not modeled, but the average model of a traditional,

remedial, male, and female student is given. Because of the small sample and the particular population, her findings are true only for that population. The study does not focus on the factor of long-term memory, stored representation of writing forms, audience awareness, or goals for the audience. The model she presents is writer-based. The study does not divide the composing process into enough writing tasks. The study is partially successful in achieving its purpose.

III. CONCLUSION

All the studies reviewed in this paper were descriptive studies of the composing process. They consist of more or less naturalistic observations of writers at work. Their common purpose was to characterize the composing process as a whole or one of the subprocesses. They also sought to characterize the writing processes used by skilled and unskilled writers. Most of the studies used a case study approach or used small samples making generalization of the findings impossible. Case studies were used because of their value in illuminating the psychological dimension of student

writing and because they can serve as surveying expeditions for identifying the writing territories needing further investigation and can identify variables related to the writing processes of students. The case study method allows for longer duration of observations and more of them per student in several treatment situations. The findings can be stated with regard to an individual's performance rather than an average group performance. But with case studies, no control groups are possible or comparisons between treatments or conventional statistical analyses. These pre-experimental studies need to be used as a basis for further experimental research that drops down to the level of very basic research and that climbs up to the level of applied research, testing methods and curricula.

The composing aloud method used by some of the studies has its advantages and disadvantages. Its questionable similarity to silent composing and its artificiality pose problems. Still, it may be a promising approach. Eventually we will need to assess how serious its problems are. Conclusions from even the most ambitious study, ambitious as far as the amount of data collected or the number of

composing dimensions examined, must therefore be modest. The studies using a coding schema to account for all time used in composing and for pattern identification were impressive. The coding schemas look promising for longitudinal studies of composing processes and for use by teachers in the classroom and by students to code peers and themselves once the schemes are simplified and tested for reliability. One of the main problems with the studies was lack of information, information about reliability and about the observation system used and the interviewing format. Few samples of observation notes or questions were given. Future studies must be more descriptively complete. Composing aloud, coding schemes and insufficient observation information are concerns that future researchers should take note of.

A common problem was the sampling procedures used. The samples were not representative of typical writer types but only of particular populations. Another problem was not grounding the research study on a model of composing or some model of learning. The Flower and Hayes study was grounded in a cognitive science theory, the Perl study was grounded on the discovery theory, the Graves study was grounded in

developmental theory, but the others seemingly had no theory behind them. Not having any theory behind a research study results in insignificance. The research done so far should be used to build new composing theories or to refine existing ones. Future researchers will need to be more careful when selecting samples and will need to select a theory for their research.

The Flower and Hayes study and the Perl study were important contributions to composing research because of their findings, methodology and theories. The studies illustrate the kind of in-depth research that can be done when the composing task is divided into writing task subprocesses such as the rhetorical problem in Flower and Hayes and the creative discovery of meaning in Perl. The findings of Flower and Hayes that the writing needs to be organized around a central goal, is hierarchically organized, has some processes that pre-empt others, is recursively organized, and is an understanding process, have important implications for teachers and researchers. Other findings from these reviewed studies that also have educational implications are that writers need to be engaged in the writing process and explicitly

taught about it, that writers do little preplanning, make no outlines, do not know ahead of time what they will write about, that they need to be reader-based, that premature editing thwarts composing and that revising is infrequently done and when it is, is usually only cosmetic. Because of these findings, composition teachers will need to be retrained and composition textbooks thrown away and new ones written.

The cognitive scientists' model of what to do in designing composing process studies is a powerful model and should be used and refined by future researchers. They should continue to attend to the act of writing and try to model the writing process by identifying the processes and determining how they work together to produce a text. They need to see how simultaneous processes interact with one another. Too many of the studies reviewed stopped with identifying the processes. That is only a first step. The next step is to explain how parts work together as a technical writer must do when he describes a machine in operation. This explaining is difficult to do because the operation is a dynamic one with interrelationships. The

novice technical writer will usually stop with identifying a machine at rest, a static condition, because all he has to do is identify and describe the parts. The novice researcher of the composing process so far has been like the novice technical writer; he is content with characterizing the parts. New research studies must be explanatory as well as descriptive. Future researchers should model the individual writer in hopes that there will turn out to be only a few variant types. They should use an integrated "top-down" and "bottom-up" approach, for both are needed. The world should be divided up into manageable writing tasks. Long-term memory should be investigated, as well as the rhetorical situation, other past experiences and environments outside of the writer's skin; all should be studied.

Composing process researchers should take note of what is going on in reading research. Much of the research is applicable to composing research. One area that is important to pursue in research is the reading done in the composing process--rereading and proofreading are different kinds of reading. The relationship between reading and writing are close, with the processes in reverse. New models should

include the rereading/proofreading processes, too. The theories being applied to reading research such as schema theory, metacognition theory, and the scripts, plans, and actions theory, can be applied to composing. The use of artificial intelligence models might be studied for application to composing research. Theories of the reading process as a high level perceptual task and an inferential task are pertinent for the composing process. More research is needed on creativity and affect, also.

New directions for composing process research include becoming more scientific and experimental, and becoming more interdisciplinarian in order to develop a comprehensive, coherent theory of the composing process. Until this is accomplished, the state of the art for composing process research will remain pre-paradigmatic.

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